Abstract
This article examines the current development status of augmented reality as well as its future possibilities. Augmented reality applications produce computer-generated graphics that are placed on the real world. They accomplish this by superimposing digital 3D models or plain text information over and around the physical objects within the radius. This makes the surrounding environment interactive. The applications of augmented reality are diverse and extensive. The conclusion of the study indicates the need for a comprehensive system that integrates both safety awareness and safety training, as opposed to focusing on either one of these two aspects of safety.

Keyword - Cloud Computing; Encryption Homomorphic;

Introduction
The phrase "augmented reality" refers to a technology that enhances a user's real-time vision by superimposing computer-generated pictures on the screen they are now seeing. Marker-based augmented reality is an example of augmented reality, in which digital information and animations pertinent to the real world are connected via augmented reality markers. When it receives digital data from a known marker, the program commences the execution of the marker's underlying related features and builds the relevant 3D models. The word "augmented reality" refers to a relatively new technology that has already been adopted by numerous industries, including medicine, the military, tourism, and most recently human safety. In the spirit of the original survey, however, we define augmented reality systems as sharing the following characteristics:

1) Blends real and virtual, in a real environment
2) Real-time interactive
3) Registered in 3D

Registration is the procedure of accurately aligning real and digital objects. If accurate registration is not accomplished, the illusion that the virtual objects exist in the actual world will be severely compromised. Applications of augmented reality are less expensive and more effective methods for enhancing human safety. The only requirement is the use of an augmented reality system, which may be integrated into supporting hardware such as a smartphone. Because the application will train the user on basic safety procedures beginning with the foundations, the individual does not need any prior knowledge of safety in order to begin utilizing the system. In addition, no prior professional knowledge is necessary in order to use the system independently.

The purpose of this review is to critically evaluate a set of augmented reality (AR) systems that have been implemented to improve people's safety awareness and emergency response, and to derive a set of ideal parameters that can serve as the foundation for a much more advanced and comprehensive system. In addition, this analysis will strive to identify a set of optimal parameters that can be used to improve the system's overall quality.

The electronic triage tags for disaster relief training are among the existing systems that offer safety instruction...
and/or assist with emergency response (H. Kojima et al., 2011). These tags provide dynamically changing patient vitals tags to make the medical training exercise engaging and responsive by requiring trainees to take swift action in response to changing conditions. Simulators of virtual reality are among the additional existing devices that provide safety training and/or aid in disaster response. In the past, this was accomplished by utilising textual knowledge, which produced an immersive and fascinating atmosphere. Open Sim was utilised to develop a specialised training environment that simulates multiple crisis scenarios and wireless sensors. The latter assisted management employees and general users improve their skills by utilising wireless technology for data collecting (Perera et al., 2013) and deploy innovative disaster management solutions. This was accomplished using Open Sim, which was created by Perera et al (2013). Open Sim was utilised to develop a customised training environment. The ARP virtual reality system (Y. w. Chow et al., 2005) enhances and thereby decreases the rotational latency of existing HMDs (Head mounted displays). In addition, this system creates realistic, high-quality scenes that enhance the user's immersion and, as a result, optimise the training simulation.

ENABLING TECHNOLOGIES

A. See-Through Displays:

The development of augmented reality systems is still impeded by display technology-related challenges. There is currently no see-through display technology capable of seamlessly merging a wide variety of actual and virtual images. This is due to the unavailability of see-through displays with adequate brightness, resolution, field of view, and contrast. In addition, many of the technologies that are beginning to move in the correct direction in terms of attaining these goals are not yet tiny, lightweight, or affordable enough. In spite of this, there have been significant advances in see-through display technology over the past many years. The presence of well-known companies: Sony and Olympus, two well-established firms in the electronics and optical industries, are currently manufacturing head-mounted displays that are opaque, colour, LCD-based, and geared for watching videos and playing video games. Even though these devices have a low resolution (180K*240K pixels), a small field of view (about 30° horizontal), and do not support stereo, they are reasonably lightweight (around 120 grammes), making them a cost-effective option for video see-through research. Since Sony's release of true SVGA resolution optical see-through screens, including stereo ones (which were later abandoned), they have been widely utilised in augmented reality research. This technology is implemented in products such as Google Glass.

B. Projection Displays:

Projection of the relevant virtual information directly onto the physical elements in the actual world that are to be upgraded is an alternate way for establishing augmented reality (AR) (AR). In the simplest case, the augmentations are supposed to be coplanar with the surface on which they are projected, and they can be projected monoscopically from a projector that is positioned in the room, meaning that special eyewear is not necessary to observe them. A projection of optical pathways that have been taken through simulated elements on a virtual optical bench is one example. Another is an application in which a remote user controls a laser pointer that is worn by another user in order to point out an object of interest.

Figure 2 (Heads Up Display)

C. New Tracking Sensors and Approaches:

IV. FOR AUGMENTED REALITY REGISTRATION, IT IS VITAL THAT THE USER'S VIEWING DIRECTION and location be precisely tracked. several distinct systems have demonstrated exceptional registration in regulated indoor environments. typically, these types of systems employ hybrid tracking methods (such as magnetic and video sensors) to capitalise on the merits of individual tracking technologies and compensate for their shortcomings. by combining accelerometers with video tracking, a system achieved precise registration. this was demonstrated even with rapid head movement, the single constraint at a time (scaat) technique, which integrates individual data at their exact time of occurrence, has also led to the enhancement of tracking.
performance. This has led to quicker update rates, more precise solutions, and automatically calibrated parameters. Constellation and the HiBall are two new scalable tracking systems capable of spanning the vast indoor environments required by certain augmented reality applications. Intersense and 3rdTech offer commercially available versions of these trackers, respectively. Despite the fact that current augmented reality (AR) systems have demonstrated strong and compelling registration in controlled, indoor situations, there is still a lot of work to be done in terms of tracking and calibration. Current research focuses on the sensing of the entire environment, operation in unprepared conditions, decrease of latency, and reduction of calibration requirements. Sensing the environment is necessary for efficient augmented reality since it is not enough to know where the user is; you must also know where everything else of interest is. To enable occlusion correctly, for example, the rendering process requires a depth map based on the actual scene. Recent studies have demonstrated that it is possible to create a real-time depth map by merging the data from many cameras and then reprojecting the depth map to a new viewing position. Alternately, it has been demonstrated that a tracking system may automatically detect and measure new natural features in the environment, even when only a small number of features are known to be there. If you have a video sequence but no tracking information, a large amount of research has been conducted on how to reconstruct the camera's movements. These approaches no longer function in real time and are best suited for post-production or the development of special effects. However, these algorithms have the potential to be used in augmented reality (AR), and it will be a remarkable achievement if they can operate in real time and take causal action (without making use of prior knowledge of what will occur in the future). In one example of this type, user-provided planar attributes are used to monitor the user's orientation and position as it changes.

INTERFACES AND VISUALISATION

During the past five years, the breadth of AR research has expanded dramatically. In addition to developing the core technologies that will enable augmented reality, researchers are contemplating how users will interact with and run augmented reality applications, as well as how AR displays should present information.

1) User Interface and Its Interaction:

The majority of augmented reality interfaces were modelled after desktops or copied concepts from studies of virtual environments until relatively recently. Diverse designs and tactile interfaces are one of the most popular topics in interaction research, particularly as they pertain to augmented reality (AR) systems. Real and virtual components are blended in heterogeneous techniques. Tangible interfaces emphasise the use of genuine, tangible instruments and objects. Given that the user of an augmented reality system sees the real world and frequently desires to interact with real objects, it makes sense for the augmented reality interface to include a real component as opposed to being entirely virtual.

2) Visualisation Problems:

Due to the fundamental characteristics of augmented reality technologies or displays, researchers have begun to investigate the challenges that arise while showing data in augmented reality displays. Efforts have been made to visualise registration errors and prevent the concealing of critical data as a result of density problems. Error visualisation: In certain augmented reality (AR) systems, registration errors are large and unavoidable. It is possible, for example, that the measured location of an object in the environment is not precisely understood enough to remove obvious registration error. In such cases, one way for depicting an object is to graphically portray the area in screen space where the object could reside, based on anticipated tracking and measurement errors. This is performed to replicate the object's appearance. This ensures that the virtual representation will always contain its equivalent in the physical world. When rendering virtual objects that should be obscured by actual objects, a probabilistic function that gradually fades out the hidden virtual object along the boundaries of the occluded zone is an additional technique that can be used. This strategy reduces the repercussions of registration errors, making them more tolerable.

3) Advanced Rendering

Ideally, virtual augmentations would be indistinguishable from real objects. Such high quality renderings and compositions are not currently feasible in real time. However, researchers have begun studying the problems of removing real objects from the
environment (a.k.a. Mediated Reality) and more photorealistic rendering (although not yet in real time). Mediated Reality: The problem of removing real objects is more than simply extracting depth information from a scene, as discussed previously in the section on tracking; the system must also be able to segment individual objects in that environment. Lepetit discusses a semiautomatic method for identifying objects and their locations in the scene through silhouettes. This enables the insertion of virtual objects and deletion of real objects without an explicit 3D reconstruction of the environment.

Photorealistic rendering: A key requirement for improving the rendering quality of virtual objects in AR applications is the ability to automatically capture the environmental illumination information. Two examples of work in this area are an approach that uses ellipsoidal models to estimate illumination parameters and Photometric Image-Based Rendering.

NEW APPLICATIONS

In addition to advancements in the application areas covered by the 1997 study, there has been substantial work that we have been able to group into three additional categories: outdoor and mobile augmented reality, collaborative augmented reality, and commercial applications. This new application development is a result of a greater understanding of the application of augmented reality (AR), the development of trackers and displays, and the escalating availability and affordability of processing power. What in 1993 required a complex distributed system over a handful of top-of-the-line computers can now be accomplished with a single, off-the-shelf PC laptop; as a result, academics can focus on more ambitious projects (such as building mobile augmented reality systems) and new research issues (such as collaboration across multiple co-located or remote users). Increases in computing power have enabled the first economically viable applications. Before continuing on to examine these additional areas, we will quickly highlight representative developments in the 1997 study's application areas. Curtis and his colleagues disclose in their paper the validation of an AR system for aircraft wire bundle construction (this application was discussed in the original survey, but was not yet complete or tested). In spite of the constraints imposed by tracking and display technology, the company's augmented reality (AR) system performed well in testing done with actual assembly-line workers. These studies indicated that workers were able to manufacture wire bundles that functioned similarly to those created using conventional techniques.

Changes within the Commercial Sector The use of augmented reality (AR) to enhance live broadcast footage has increased in recent years, particularly for the aim of enhancing athletic events and inserting or removing advertisements within a scene. An early example is the FoxTrax system, which revealed the location of a fast-moving hockey puck that was difficult to see.

Figure 4(Augmented reality in Sports)

to obtain correct data, the environments are methodically planned beforehand, and the cameras are calibrated and tracked. in some applications, real-time video monitoring may be the only option for incorporating augmentations. in addition, the autos are tracked with pinpoint accuracy by the race f/x system utilising gps. the video to be broadcast is processed at the site where it will be broadcast, resulting in a few additional frames of latency before transmission. in order for the systems to perform effectively, the numerous settings, such as the placement of the first down line and the chroma key colour ranges for the football players, are manually adjusted in real time.

FUTURE WORK

Despite the many recent advancements in the discipline, there is still a substantial amount of work to be done in AR. If augmented reality is to become widely used, extra study is required in nine areas. Monitoring everywhere and the ability to relocate systems: Multiple exceptional augmented reality (AR) presentations have built compelling landscapes with nearly pixel-perfect registration. However, these types of presentations are only effective in highly regulated and painstakingly organised environments. This project's ultimate objective is to develop a tracking system capable of supporting accurate registration in any random, unplanned setting, whether indoors or outside. Putting augmented reality technologies into operation 11 anywhere demands portable, comfortable, and inconspicuous devices. The publication of this issue of Computers and Graphics occurred in November 2001. Installation and operation simplicity: The great majority of currently available AR systems demand the
participation of knowledgeable users for calibration and operation (typically the system designers).

If augmented reality applications are to become widespread, the systems must be deployable and operable by non-expert users. This requires more robust solutions that prevent or minimise calibration and setup requirements. Among the trends in research that support this need are calibration-free and auto-calibration algorithms for sensor processing and registration. Since an AR system alters the user's impression of the state of the real environment, the system should ideally be able to continuously sense the condition of everything in the environment. Instead of only tracking the user's head and hands, an augmented reality (AR) system should track all body parts, as well as all objects and people in the surroundings. Systems that obtain real-time information about the surrounding environment's depth through vision-based and scanning-light techniques indicate advances in this direction. Interface and visualisation paradigms: Researchers must continue to create new interface techniques to replace the WIMP standard, which is inadequate for wearable augmented reality (AR) devices. Density, occlusion, and general situational awareness concerns require new visualisation methods. Creating and presenting narrative performances and structures may result in more realistic and immersive augmented reality (AR) experiences. Numerous concepts and prototypes of augmented reality (AR) apps have been developed, however experimental validation and measurable performance improvements in an AR application are scarce. This evidence is essential to justify the cost and effort required to implement this new technology. Few user studies have been conducted with augmented reality (AR) devices, possibly because few experimenters have access to such systems. Basic visual conflicts and optical illusions resulting from the combination of real and virtual require additional research. The interfaces and visualisation methodologies created for AR systems must be guided and validated by experimental findings. Photorealism and sophisticated rendering: Although many augmented reality applications use only simple graphics like wireframe edges and text labels, the ultimate objective is to create an experience in which the virtual and real worlds cannot be distinguished. This must be completed in real time, without the assistance of manually working artists or programmers. There has been some progress in this area, if not always in real time, and it is now being pursued. Because the ability to detach real objects from their environments is so crucial, such Mediated Reality approaches must be developed. AR in all senses of the term: Researchers have mostly focused on creating techniques to enhance visual acuity. At some time in the future, immersive augmented reality settings may need the use of additional senses (touch, hearing, etc.) For example, recently developed technologies present a tactile and auditory augmented reality world. Another challenge that must be addressed before augmented reality technology can be extensively adopted is societal acceptance.

Users are required to examine the social implications of the technology. The tracking required for the presentation of information can also be used for monitoring and recording. How will those without augmented reality interact with those having augmented reality? Even fashion is a factor: will users use the device freely if they believe it detracts from their overall appearance?

CONCLUSION

The idea of augmented reality is one of the most intriguing advances in technology that our generation has witnessed. [Citation needed] The occurrence of a great deal more in the not too distant future may be made possible as a result of this. It can be utilised in practically every industry that contemporary man has become familiar with. At this point, all we can do is keep our fingers crossed and do everything we can to prevent
virtual reality from supplanting the actual world as the primary form of experience.

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